Translation of EP 1 074 304 A1, excluding the claims

Description

Document destroyers are in general use in offices. They serve to shred files and confidential papers in such a way that reading same is either impossible or can be achieved with great difficulties only. More particularly, it is the intention to prevent confidential information from reaching third persons in the course of the disposal of waste paper. For this purpose, the document destroyers are provided with a cutting mechanism to which the paper to be cut is fed through a supply aperture. After the paper to be cut has been cut, the cut material is thrown through an ejection aperture into a receptacle. It is generally known to cut the material into strips, with the material to be cut being cut in the cutting mechanism into a plurality of narrow strips. Furthermore, it is known to carry out a so-called particle cut wherein the material to be cut is not only cut into a number of strips in the cutting mechanism, but wherein, at the same time, the strips are torn in the transverse direction, so that there are produced small particles. The greater the degree of confidentiality of the documents, the narrower the strips and the shorter the particles.

In addition to files, i.e. paper data carriers, confidential information is frequently contained on foil which is coated. For example, in fax machines and other printing machines, use is made of so-called thermo transfer foil which is coated with a material which is transferred to a surface to be printed on and which is fixed on said surface through the application of heat. As in the region of the removed coating, a new printing operation cannot be carried out, such foil, during the printing operation, is moved past the surfaces to be printed on. The thermo transfer foil supplied and removed by rollers thus contains the printed matter in a negative form. Furthermore it is known to store data and other information also on tapes, cassettes and the like. Such data carriers each contain a

foil material which is coated with a magnetisable material and serves as an information carrier.

In the case of such information carriers to be destroyed, it is normally necessary to carry out a particle cut as it is not sufficient to cut the long pieces of foil into strips. If only because of the length of the foil which could be as much as several metres, cutting the material into strips is not sufficient. On the other hand, such coated foil is disadvantageous in that, because of the very small foil thickness, the particles are extremely light-weight. On the other hand, the particles have a tendency of becoming electrostatically charged during the cutting and tearing operations because, as a rule, the foil material consists of plastics. When using conventional document destroyers, this means that during the operation of cutting such information carriers, the cut particles cannot be reliably removed. On the contrary, the ejection aperture of the cutting mechanism has a tendency of becoming blocked or, because of their electrostatic charge and their low weight, particles are ejected from the supply aperture of the cutting mechanism.

Object of the invention and solution

It is the object of the invention to develop prior art document destroyers in such a way that they are capable of cutting coated foil in a problem-free way.

The objective is achieved by a document destroyer of the above species with the characteristics of Claim 1.

An inventive document destroyer comprises a cutting mechanism which is suitable for cutting the material to be cut into particles. The material to be cut is fed into the cutting mechanism through a supply aperture and leaves the cutting mechanism through the ejection aperture after having been cut into particles. The ejection aperture leads to a receptacle. The material to be cut also includes coated foil, with particle suction means being provided at the ejection aperture end.

Further advantageous embodiments of the invention are described in the sub-claims. On the one hand, they concern the design of the receptacle, the design of the ejection aperture, the arrangement of the receptacle and suction system relative to the cutting mechanism and a two-channel design of the ejection aperture, as well as the design of the supply means for the material to be cut.

The above and further characteristics are given not only in the claims but also in the description and in the drawings, wherein the individual characteristics can be put into effect either individually or in a combined form of sub-combinations in an embodiment of the invention and in other fields, and they can constitute advantageous and protectable embodiments each of which can claim protection. By dividing the application into individual parts and by providing intermediate headings, the respective statements are not restricted in respect of their general validity.

Brief description of the drawing

Below, the invention will be explained in greater detail with reference to embodiments illustrated in the drawing wherein

Figure 1 is an isometric illustration of the inventive document destroyer with roller supply means for the material to be cut as well as with suction means arranged in the lower part of the assembly.

Figure 2 is a diagrammatic illustration of a two-channel embodiment with externally arranged suction means.

Description of the embodiments

Figure 1 shows an isometric illustration of a document destroyer which is also suitable for cutting foil and which can also carry out particle cuts.

The document destroyer 11 comprises a cutting mechanism 12 of which the diagrammatic illustration only shows the cutting rollers. The cutting mechanism 12 is supplied via the supply aperture 13 with the material 14 to be cut. More particularly, the material 14 to be cut can be a length of foil which is fed into the cutting mechanism from a roll 26. To be able to process the material 14 in the form of a roll 26, the document destroyer 11 comprises roll holding means 25 to which rolls 26 of material to be cut are rotatably fixed in accordance with the cutting width of the cutting mechanism 12. Because the material to be cut is pulled into the cutting mechanism during the cutting operation, the material to be cut is continuously rolled off the roll 26 during the cutting operation.

For the purpose of carrying out the particle cut, the cutting mechanism 12 contains cutting rollers 35. There are many prior art embodiments of cutting rollers for carrying out a particle cut. In the present case, the design of the cutting rollers 35 is of no importance, so that, in this respect, reference is made to the state of the art.

The particles 16 leave the cutting mechanism 12 through the ejection aperture 15. They then reach the receptacle 17. In the present embodiment, the ejection aperture 15 is provided in the form of a collecting funnel 27 which ends in a piece of tubing 28. Through the piece of tubing 28, the particles reach the receptacle 17.

The receptacle 17 as illustrated is provided in the form of a bag 18 which is arranged in the carrying structure 19. To ensure efficient suction, the bag 18 is removably secured by the clip 29 to the piece of tubing 28 in such a way that, preferably, no additional air is sucked in.

The bag 18, in accordance with a vacuum cleaner bag, is designed in such a way that air can flow through the wall of the bag while particles and any cutting dust generated are

retained in the bag. The airtight sealing of the bag 18, which can also be a sack, and the collection of the particles in a closed container are advantageous features even in those cases where the foil contains a coating which must not be touched. Certain coated technical papers can also be regarded as such a foil.

The carrying structure 19, parts of which are shown in a small side wall portion, comprises air passage apertures 20 in its side walls. The air passage apertures 20 can be provided in the form of slots or holes for example. If the suction means function correctly, there is generated an air flow wherein air enters the cutting mechanisms 12 through the supply aperture 13. From the cutting mechanism 12, the air flows through the receptacle 17 via the piece of tubing 28 into the interior of the bag 18. Particle-free air is now guided through the wall of the bag and optionally also through the air passage aperture 20 of the carrying structure 19. The air slots 34 constitute the flow connection for the suction air of the blower arranged in the bottom region of the lower cabinet 31.The blower 32 is separated from the accessible region of the lower cabinet 31 by the separating plate 33 containing the air slots 34. Air is sucked in through the air slots 34 from the lower cabinet and ejected by the blower via the suction pipe 36 from the lower cabinet 31.

After having passed the cutting mechanism 12, the material 14 cut into particles, because of the suction effect, is transported through the piece of tubing 28 into the bag 18. In order to prevent a return flow of the particles, especially when switching off the blower, a locking valve (not illustrated in this drawing) can be arranged at one of the two ends of the piece of tubing 28. The locking valve must be self-locking as soon as the suction of air through the piece of tubing 28 falls short of a predetermined rate. More particularly, the locking valve can be a rubber valve in which a rubber flap locks the flow path in the position of rest.

Figure 2, in a diagrammatic illustration, shows an inventive document destroyer wherein the ejection aperture is of the two-channel type, wherein the first channel comprises

suction means and, more particularly, is used for material consisting of coated foil and wherein the second channel is provided for other material to be cut (more particularly paper).

The material to be cut is supplied to the cutting mechanism 12. In the cutting mechanism 12, the material to be cut is cut into particles, again by means of cutting rollers. From the cutting mechanism 12, the particles 16 reach the ejection aperture 15. The ejection aperture 15 is provided in the form of a collecting funnel 27 which ends in the piece of tubing 28. The collecting funnel 27 is arranged at guiding means 39 either in the form of guiding rails, as illustrated, or in the form of a joint which allows the collecting funnel 27 to pivot, which guiding means allow the collecting funnel 27 to be moved into an operating position which makes it possible for the particles 16, while passing the collecting funnel, to move from the cutting mechanism 12 directly into the receptacle 17, as a result of which the second channel 22 is formed. The first channel 21 leads through the locking valve 30 to the connecting sleeve 23 fixed to an outer wall in the lower cabinet 31 of the document destroyer. As diagrammatically illustrated, the locking valve 30 is provided in the form of a flap valve wherein in those cases where suction takes place in the first channel 21, the flaps open in the direction of flow, whereas the flaps close if the flow no longer reaches a minimum rate. The suction hose 38 is arranged at the connecting sleeve 23. The suction hose 38 lengthens the first channel 21 as far as the receptacle 17 of an external suction device 24. The second channel 22 extends past the collecting funnel 27 and also to a receptacle. The switching valve is provided in the form of a rubber flap for example which closes if an air flow passes through the first channel 21 to the connecting sleeve 23. More particularly, the switching valve 27 can be designed to be self-locking, with the switching valve 37 locking in those cases where the air flow in the first channel 21 exceeds a predetermined minimum flow rate. If the switching valve is open, as shown in the drawing, the cut particles can pass through the piece of tubing 28 to the second channel 22. This is the case, if no suction takes place. For the second channel, too, it is possible to provide suction means for the particles. Through simple gravitation, the particles 36 pass through the second channel 22 into the receptacle 17.

The particles 16 moving without suction normally consist of paper which can be disposed of and recycled. For this purpose, the receptacle 17 can easily be removed from the lower cabinet 31 and exchanged.

According to an alternative embodiment not shown in the drawing, the two-channel system can also be achieved by a switching valve arranged behind the collecting funnel 27.

If the particles are sucked off, the collecting funnel is moved into the operating position underneath the ejection means of the cutting mechanism 12. The path to the second channel 22 is now blocked for the particles 16. They pass through the first channel 21 and through the locking valve 30 via the connecting sleeve 23 and the suction hose 38 into the housing of the external suction device 24. The suction hose 38 ends in a receptacle 17. Again, the receptacle 17 is formed by a bag 18 which is arranged at a carrying structure 19 provided with air passage apertures 20. The bag 18 is removably fixed to the inlet aperture of the suction hose 38 by a clip 29 for example. The air flow through the first channel 28 and through the suction hose 38 passes through the wall of the bag 18 and through the air passage apertures 20 of the carrying structure 19. The carrying structure 19 provides support for the bag 18, so that the bag does not tear as a result of the weight of the particles 16 collected in the bag 18, mostly coated foil, e.g. thermo transfer foil, and the load caused by the air flow. Via air slots 34 in the separating plates 33, the air flow reaches the blower 32 from where the air is blown out through the exhaust pipe 36.

The two-channel embodiment is particularly advantageous if frequently both foil material and paper are used for the purpose of being cut. If foil material is to be cut, the suction means have to be activated by the user through the external suction device. It is also possible, for this purpose, to provide control means at the housing of the document destroyer 11. More particularly, these can be provided in the form of an additional switch. At the same time, this achieves a separation of the material cut into particles, so that it can be disposed of according to types. The external suction device 24 can be either

a suction device arranged locally, for example directly next to the document destroyer 11, or it can be a central suction system connected to a plurality of document destroyers 11.

If the suction device is a local, external suction device, it can also be arranged in a housing of the document destroyer 11. The local, external suction device can also be a conventional (industrial) vacuum cleaner.

If the suction device is a central, external suction device which serves a plurality of document destroyers , it is advantageous to design the suction device in such a way that there is provided a suction hose assembly which comprises valves, so that only the suction hose contains an air flow, with the document destroyer being in an operating mode in which suction is to take place.